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09/915,985	07/25/2001	Detlef Hommel	1999P8006 US N	8172

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EXAMINER

IM, JUNGHWA M

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 01/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/915,985

Applicant(s)

HOMMEL ET AL.

Examiner

Junghwa M. Im

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3, 9. 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Pat. No. 5,198,690 to Kitagawa et al.

Kitagawa et al. teach, in Fig10, a semiconductor component for generating visible polychromatic light, comprising:

a semiconductor chip having a first semiconductor layer(27) and second semiconductor layer adjacent to said first semiconductor layer (29);

said second semiconductor layer including an electroluminescent region emitting visible light of a first color having a first wavelength (col.12, lines 11-12);

said first semiconductor layer absorbing part of the visible light of the first color and said first semiconductor layer re-emitting visible light of a second color having a second wavelength, the second color being different from the first color, and the second wavelength being longer than the first wavelength ( col. 12, lines 10-15); and

said semiconductor chip emitting the visible light of the second color together with the visible light of the first color (col. 12, lines 10-14); and

said first semiconductor layer and said second semiconductor layer being configured to emit white light from said semiconductor chip (col.12, lines 21-23).

Regarding the first semiconductor layer with a first band gap and electroluminescent region having a second band gap, while the first band gap being smaller than the second band gap, it is alternatively obvious that the first layer with a longer wave length will have a smaller band gap than the second layer with a longer wavelength.

Regarding claim 4, Kitagawa et al. teach a substrate for epitaxially growing the second semiconductor layer is also utilized as the first semiconductor layer (col. 12, lines 9-10).

Regarding claim 5, Kitagawa teach a semiconductor chip includes a growth substrate and the first semiconductor layer is disposed between the growth substrate and the second semiconductor layer (col. 12, lines 8-14).

Regarding claim 6, Kitagawa et al. teach a semiconductor chip includes a growth substrate for epitaxially growing the second semiconductor layer and the second semiconductor layer has a side opposite the growth substrate while the first semiconductor layer is disposed on the side of the second semiconductor layer opposite said growth substrate (col. 12, lines 8-16).

### ***Claim Rejections - 35 USC § 103***

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagawa et al. in view of the admitted prior art to Henry et al.

Kitagawa et al. do not explicitly teach that the first layer includes a material

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with an absorption edge having an energy level corresponding to a third wavelength which is longer than the first wavelength of the visible light emitted by the semiconductor layer and is shorter than the second wavelength; and re-emitting radiation of the second wavelength when excited with radiation of a wavelength shorter than the third wavelength.

Henry et al., however, show a re-emitting layer (7) in Fig. 5 with a wavelength which is longer than the first layer and shorter than the second layer with the claimed emission state. (col. 4, lines 47-68).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teaching of Henry et al. into the device taught by Kitagawa et al. since such a layer with the material minimizes the possible the migration defects of the light in the substrate.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagawa et al. in view of U.S. Pat. No. 5,488,233 to Ishikawa et al.

Regarding claim 7, Kitagawa et al. teach that the first semiconductor layer includes doped ZnSe (col. 1, lines 32-34). However, Kitagawa et al. do not explicitly teach second semiconductor layer has an active zone containing  $\text{Cd}_x\text{Zn}_{1-x}\text{Se}/\text{ZnSe}$  with  $0 \leq x \leq 1$ .

Ishikawa et al. teach that an LED with a  $\text{CdZnSe}/\text{ZnSe}$  layer (107) in Fig. 5, formed between the light emitting layers.

It would have been obvious to one of ordinary skill in the art at the time of the

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invention was made to employ the teaching of Ishikawa et al. to the device taught by Kitagawa et al. since such modification can improve reliability of the device with better light emitting efficiency.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitagawa et al. in view of U.S. Pat. No. 4,784,722 to Liao et al.

Regarding claim 8, Kitagawa et al. do not explicitly teach that semiconductor chip being disposed in a parabolic mirror.

Liao et al. teach that a light emitting diode with a parabolic mirror (32) in Fig. 3.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teaching of Liao into the device taught by Kitagawa et al. since a parabolic mirror on a light emitting device can allow the higher efficiency of the reflectivity favoring the performance of the device.

### ***Response to Arguments***

Applicant's arguments filed on November 5, 2002 have been fully considered but they are not persuasive. The rejection stands, modified only to accommodate the amendments made to Applicant's amended claims.

In addition, Examiner presents the remarks below in response to Applicant's arguments.

On page 5 of the Amendment, Applicant argues that Kitagawa et al. only disclose LED elements with a p-n junction and the n-layer especially contains zinc as semiconductor material.

Note that starting on page 14, line 4 of the specification, Applicant also discloses a p-n diode with a zinc-containing layer as one of the examples to meet the specific limitation as claimed.

In response to Applicant's argument related to Example 10, Kitagawa et al. explicitly teach that a device emits two different lights, green and blue, especially green light is emitted by re-emission of the part of blue light which excites the substrate. Thus, as taught in column 12, lines 10-16 of the specification, the device of Kitagawa et al. is useful for "two" light band device and variable tone device that can emit blue and green light.

Also, Applicant argues that Kitagawa et al. disclose the use of an additional LED to mix with green and blue light to produce white light while the instant invention has an advantage of using a single device. Note that column 12, line 17 of the specification of Kitagawa et al. teaches "Particularly, a high luminous pure white and green light diode can be constructed by removing a part of GaP substrate. Note that a high luminous pure white and green light appears white to the human eye. In addition, Kitagawa et al. further teach "...HENCE, the light emitting device .... combined with ...of GaAsP, GaAlAs or the like (instead of LED of GaP) to constitute ...white light emitting diode (thus, implying one semiconductor chip as recited in claim 1 of the instant invention).

### ***Conclusion***

The prior art made of record and relied upon is considered pertinent to Applicant's disclosure.

JP 10-282494 to Kaneko

JP 09-204982 to Ikezu

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**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

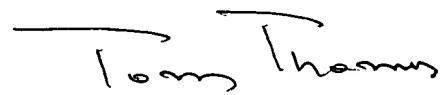
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Junghwa M. Im whose telephone number is (703) 305-3998. The examiner can normally be reached on MON.-FRI. 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JMI  
January 27, 2003

  
TOM THOMAS  
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